



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,520	11/10/2003	Hung-Kun Chen	251316-1260	4845
24504	7590	03/07/2007	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP			WANG, TED M	
100 GALLERIA PARKWAY, NW				
STE 1750			ART UNIT	PAPER NUMBER
ATLANTA, GA 30339-5948			2611	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/07/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

SF

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/705,520	CHEN, HUNG-KUN
	<b>Examiner</b>	<b>Art Unit</b>
	Ted M. Wang	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 10 November 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-19 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 1-17 is/are allowed.
- 6) Claim(s) 18 and 19 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 November 2003 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received:

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claim 19 is rejected under 35 U.S.C. 112 second paragraph, because there is insufficient antecedent basis for this limitation in the claim.
  - Claim 19, the limitation of "the *i*th symbol,  $\Omega_{C,i}$ " in line 3 as recited is insufficient antecedent basis for this limitation in the claim since " *i*th symbol,  $\Omega_{C,i}$ " has not been introduced previously in the claim or the independent claim 18.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by Luise et al. ("Carrier Frequency Acquisition and Tracking for OFDM System", Communications, IEEE Transactions on Volume 44, Issue 11, Nov. 1996, page(s):1590 - 1598, Digital Object Identifier 10.1109/26.544476).

Art Unit: 2611

- With regard claim 18, Luise et al. discloses a phase and frequency tracking apparatus for multi-carrier systems (Fig.5), comprising: a pre-DFT synchronizer (Fig.5 element multiplier, receiving input signal  $r(t)$  and NCO output) for compensating the phase and frequency of a received signal (Fig.5 element  $r(t)$ ) in a time domain (since the multiplier is operated before DFT, it is inherent that it is in the time domain.) using a feedback compensation frequency (Fig.5 element NCO output,  $\exp(-j2\Delta f_i t)$ ) before taking an N-point Discrete Fourier Transform (Fig.5 element DFT) .

***Allowable Subject Matter***

5. Claims 1-17 are allowed.
6. The following is an examiner's statement of reasons for allowance.
  - The prior art fails to teach an apparatus of Claims 1, 6 and 12 that specifically comprises the following:
    - The instant application is deemed to be directed to a non-obvious improvement over Luise et al. ("Carrier Frequency Acquisition and Tracking for OFDM System", Communications, IEEE Transactions on Volume 44, Issue 11, Nov. 1996, page(s):1590 - 1598, Digital Object Identifier 10.1109/26.544476) and the invention patented in Pat. No. US 7,009,932, US 6,807,241 and US 5,970,397. The improvement comprises
      - "an mth-order tracking loop for computing a phase tracking value, a normalized frequency tracking value and a normalized acceleration

Art Unit: 2611

tracking value for a current symbol based on a phase estimate of said current symbol and a plurality of loop parameters; a frequency predictor for calculating as output a feedback compensation frequency for a next symbol based on an equivalent feedback delay, said normalized frequency tracking value and said normalized acceleration tracking value of said current symbol;" as recited.

***Conclusion***

7. Reference(s) US 7,009,932, US 6,807,241 and US 5,970,397 are cited because they are put pertinent to the phase and frequency tracking loop for a multicarrier transmission system. However, none of references teach detailed connection as recited in claim.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang  
Examiner  
Art Unit 2611

Ted M. Wang

A handwritten signature in black ink, appearing to read "Ted M. Wang".